

KEMPSEY BYPASS

CONTROLLED MODULUS COLUMNS



Client: Kempsey Bypass Alliance (RTA)
Consultant: Aecom Coffey

Contractor: Leighton Contractors Pty Ltd
Specialist Contractor: Menard Bachy

THE PROJECT

Leighton Contractors Pty Limited have formed an Alliance with the Roads and Traffic Authority (RTA) of New South Wales (NSW), Coffey Geosciences Pty Limited and Aecom to deliver the Kempsey Bypass Project. As part of the upgrade of the Pacific Highway, the Kempsey Bypass Alliance scope of works includes the design and construction of 14.5 km of four-lane divided highway from Kempsey to Frederickton, excluding 3 km of major bridge crossings of the Macleay River and floodplain.

The project is to be constructed on soft soils with settlement characteristics. To minimise the effect of settlement a number of “hard” ground treatment techniques were being reviewed as part of an open tender process involving specialist contractors.

MENARD BACHY'S ROLE

Menard Bachy constructed 875 numbers CMC 450mm diameter piles to depths of between 7 and 11 metres under embankment 12.1B located on the left bank of the Macleay River near Frederickton between 7 January and 11 February 2011.

Part of the design scheme included 6 rows of “stepped” columns, stopped 2m short of the embedment level to act as a transition zone between pile reinforced soil and unreinforced. The equipment used was an LRB 155 with a 22 meters mast together with a Soilmec P80 concrete pump.

The CMCs are conforming to the following criteria:

1. Column concrete in accordance with RTA QA specification B80 and the Kempsey Bypass Durability plan.
2. Columns are constructed using full displacement techniques
3. Columns are constructed with 40 year design life.

All materials and workmanship are in accordance with RTA QA Specification TB63. The mix design included a majority of 10MPa concrete columns with the two rows at the periphery made of 40MPa concrete.

Acceptance and Conformance Testing included QA and QC Testing as well as PDA and PIT tests on columns designated in advance.